

**SELF-CLOSING FAUCET WITH SHEARING ACTION****Cross Reference to Related Applications**

This applications claims priority from and benefit of the filing date of the following  
5 U.S. provisional applications: Serial No. 60/415,664 filed October 3, 2002; Serial No.  
60/426,131 filed November 14, 2002; and, Serial No. 60/493,210 filed August 6, 2003, and  
all of these provisional applications are hereby expressly incorporated by reference into this  
specification.

**Background of the Invention**

10 A wide variety of faucets for dispensing liquids from containers such as coffee urns,  
juice containers, iced tea containers and the like are well known and in widespread use. In a  
typical arrangement, a resilient seat cup or other flexible sealing member is biased into  
sealing engagement with a valve seat. The seat cup or other sealing member is selectively  
deformed or otherwise moved away from the valve seat to allow liquid flow therepast.

15 When liquids include suspended solids (e.g., juice containing pulp), it is possible for  
the solids to accumulate adjacent the valve seat and/or on the seal member, itself. These  
accumulated solids can interfere with proper sealing engagement between the sealing  
member and valve seat and are otherwise generally undesirable.

In certain applications, it is highly desirable to minimize contact between the liquid  
20 being dispensed and the sealing member to prevent the sealing member from imparting any  
taste to the liquid. This can occur when the liquid sits in the container/faucet for a prolonged  
period between dispensing occurrences.

Furthermore, in conventional faucets, a high quality seat cup or other sealing member  
defined from silicone or the like adds significant cost to the faucet. As such, it is desirable to  
25 minimize the mass of the sealing member to reduce the cost of the faucet and replacement  
seal members.

A need has also been identified for a faucet that overcomes the above-noted

deficiencies and others while also providing self-closing action.

### **Summary of the Invention**

In accordance with an aspect of the present invention, a faucet comprises: a body comprising: (i) a main bore; and, (ii) a sealing face; a stem comprising a first portion that defines a flow path, wherein said flow path communicates with said main bore, said stem being slidable between first and second positions relative to said body; a seal that moves with said stem between said first and second positions, wherein said seal engages said sealing face of said body when said stem is located in said first operative position to block liquid flow from said main bore of said body and from said flow path, and wherein said seal is spaced from said sealing face when said stem is located in said second position to allow liquid flow from said flow path and said main bore; a biasing element that resiliently biases said stem into said first position; and, a handle operably engaged with said stem to receive manual input force, wherein said stem is movable in response to movement of said handle.

In accordance with another aspect of the present invention, a faucet comprises: a body comprising a main bore and a valve seat; a bonnet connected to said body and defining a chamber; a spout comprising a dispensing bore having an inlet and an outlet, said inlet of said dispensing bore located downstream relative to said valve seat; a stem at least partially located in said chamber of said bonnet, said stem comprising a first portion that is slidably engaged with said body, said stem movable between a first position and a second position and further comprising a second portion that projects outwardly from said first portion, said second portion of said stem comprising a distal end located external to said chamber of said bonnet; a seal engaged with said stem and movable therewith when said stem moves between said first and second positions, wherein said seal is mated with said valve seat of said body when said stem is located in said first position to block fluid flow past said valve seat, and wherein said seal is spaced from said valve seat when said stem is located in said second position to allow fluid flow past said valve seat to said inlet of said dispensing bore; a spring

that normally biases said stem to said first position; and, a handle operably engaged with said distal end of said second portion of said stem, wherein said handle is manually movable to move said stem from said first position to said second position.

In accordance with another aspect of the present invention, a faucet comprises: a body  
5 defining a main bore and a valve seat; a bonnet connected to said body and defining a chamber; a spout comprising a dispensing bore that is in communication with said chamber; a stem that is slidably movable relative to said body between first and second positions, said stem comprising a portion that extends through said chamber of said bonnet and that terminates in a distal portion located external to said chamber; a handle operably engaged  
10 with said distal portion of said stem, wherein said handle is manually movable to control movement of said stem between said first and second operative positions; a seal member movable with said stem, said seal member mated with said valve seat when said stem is located in said first position and spaced from said valve seat when said stem is located in said second position, wherein said seal member blocks fluid flow from said main bore to said  
15 dispensing bore when said stem is located in said first position and said seal is mated with said valve seat.

In accordance with another aspect of the present invention, a faucet comprises: a body comprising a main bore including an inlet and an outlet, said body defining a sealing face that surrounds said outlet of said main bore; a bonnet connected to said body and defining a  
20 chamber; a spout comprising a dispensing bore located downstream from said outlet of said main bore and in communication with said chamber of said bonnet; a stem including a first portion that is inserted into said outlet of said main bore and a second portion that projects through said chamber of said bonnet to a distal end located external to said chamber of said bonnet, said first portion of said stem comprising a flow path, wherein said stem is slidably  
25 movable relative to said body and said bonnet between a first position wherein said flow path of said stem is fully inserted into said main bore, and a second position wherein a portion of said flow path is located external to said main bore; a seal carried by said stem and sealingly

engaged with said stem and said sealing face when said stem is located in said first position to block fluid flow from said main bore to said dispensing bore via said flow path, wherein said seal is spaced from said sealing face when said stem is moved to said second position to allow fluid flow from said main bore to said dispensing bore; and, a actuator handle operably  
5 connected to said distal end of said second portion of said stem and manually movable to effect movement of said stem from said first position to said second position.

### **Brief Description of Drawings**

The development comprises various components and arrangements of components, preferred embodiments of which are illustrated in the accompanying drawings that form a  
10 part hereof and wherein:

FIGURES 1A and 1B are respective left and right side elevational views of a faucet formed in accordance with the present invention;

FIGURES 2A and 2B are exploded isometric views of the faucet shown in FIGURES 1A and 1B, showing left and right sides thereof, respectively (a stem of the faucet is not  
15 shown in these views);

FIGURE 3A is an enlarged isometric view of the body portion of the faucet shown in FIGURES 1A and 1B;

FIGURE 3B is an enlarged isometric view of the bonnet portion of the faucet shown in FIGURES 1A and 1B;

20 FIGURE 3C is an enlarged isometric view of the locking clip portion of the faucet shown in FIGURES 1A and 1B;

FIGURE 4A is a side elevational view of the body portion of the faucet shown in FIGURES 1A and 1B;

FIGURE 4B is a side elevational view of an alternative body portion of the faucet  
25 shown in FIGURES 1A and 1B;

FIGURE 5A is an exploded left side sectional view of the faucet shown in FIGURES 1A and 1B;

FIGURE 5B is a sectional isometric view of the faucet shown in FIGURES 1A and 1B;

FIGURES 5C and 5D are isometric views of the stem and retainer components of the faucet shown in FIGURES 1A and 1B;

5        FIGURES 6A and 6B are sectional views of the faucet shown in FIGURES 1A and 1B, and respectively shown the faucet in a closed and an opened configuration;

FIGURE 6C shows the faucet of FIGURES 6A and 6B in an alternative opened position;

FIGURE 7A is a top plan view of an faucet formed in accordance with an alternative  
10        embodiment of the present invention;

FIGURE 7B is a section view of the faucet shown in FIGURE 7A as taken along line B-B;

FIGURE 7C is identical to FIGURE 6B but shows the faucet in its closed state; and,

FIGURES 8A and 8B are front and rear isometric views of an alternative bonnet  
15        formed in accordance with the present invention.

### **Detailed Description of Preferred Embodiments**

Referring to FIGURES 1A, 1B, 2A and 2B, a self-closing faucet with shear action is illustrated generally at **10** (a stem of the faucet is not shown in FIGURES 2A and 2B to simplify these views). Among other components described below, the faucet **10** comprises a  
20        body **A** and a bonnet **D** connected to the body **A**.

The body **A** (also shown separately in FIGURE 3A) has a first end **A1** configured to mate with an urn or other liquid-holding container or conduit in a fluid-tight manner. The body **A** comprises a second end **A2** that defines or otherwise includes a male portion of a bayonet mount **28a**. The bonnet **D** (shown separately in FIGURE 3B) defines or otherwise  
25        includes a female bayonet mount **28b** that selectively mates with the male bayonet mount **28a** of the body **A** for interconnection of the body **A** and bonnet **D** as shown in FIGURES 1A and 1B.

As best seen in FIGURES 3A,3B, the female bayonet mount **28b** comprises first and second tabs **T1,T2** (FIG. 3B) that are respectively received axially into first keyways **K1,K2** (FIG. 3A) of the male bayonet mount **28a** when the bonnet **D** is mated to the body **A** (see also FIGS. 2A,2B). When the bonnet **D** is moved axially into abutment with a shoulder **S** of the body **A**, the bonnet **D** is then rotated relative to the body so that the tabs **T1,T2** thereof move into first and second circumferential slots **SL1,SL2** (see also FIGURES 4A) to prevent axial separation of the bonnet **D** from the body **A**. With reference to FIGURES 2B and 4A, a nib **N1** projects outwardly from the body **A** adjacent the intersection of the keyway **K1** and slot **SL1**, and the tab **T1** must move resiliently over the nib **N** to move into and out of the slot **SL1**. Likewise, a nib **N2** (FIGURE 4A) projects outwardly from the body **A** adjacent the intersection of the keyway **K2** and slot **SL2**, and the tab **T2** of the female bayonet mount **28b** must move resiliently over the nib **N2** to move into and out of the slot **SL2**. Thus, the nibs **N1,N2** interact with tabs **T1,T2**, respectively, to provide a detent mechanism that inhibits undesired decoupling of the bonnet **D** from the body **A** and that also provides a user with a tactile feedback during assembly that proper interconnection of the body **A** and bonnet **D** has been effected.

Referring again to FIGURES 1A – 2B, the faucet **10** further comprises a locking clip **LC** that is selectively connected to the faucet **10** at the interface of the body **A** and bonnet **D** to prevent undesired or unintended rotation between these components **A,D** as could lead to decoupling thereof at the bayonet mount **28a, 28b**. The locking clip **LC** is shown separately in FIGURE 3C and comprises a one-piece molded plastic or metal construction that includes a central arcuate or cylindrical band **C1** having first and second enlarged opposite ends **C2,C4**. In the illustrated embodiment, the ends **C2,C4** define a T-shaped conformation on the respective ends of the band **C1**. The first enlarged end **C2** comprises first and second transverse tabs or legs **C2a,C2b**. The second enlarged end **C4** comprises first and second transverse tabs or legs **C4a,C4b**.

FIGURE 4A shows that the male bayonet mount portion **28a** of body **A** is conformed

with a recess **60** adapted to receive the band portion **C1** of the locking clip **LC** upon assembly as shown in FIGURES 1B and 1B. Furthermore, the male bayonet mount portion **28a** comprises first and second notches **62a, 64a** located at opposite ends of the recess **60** (see FIGURES 2A and 2B). Correspondingly, the female portion **28b** of the bayonet mount as defined by bonnet **D** comprises first and second notches **62b, 64b** that are respectively aligned with the notches **62a, 64a** when the body **A** and bonnet **D** are operatively coupled. Also, when the body **A** and bonnet **D** are operatively coupled via bayonet mount **28a, 328b**, a groove **60G** (FIGURES 1A, 1B) is defined between these two components owing to the presence of the recess **60** defined in body **A**.

10 As such, when the body and bonnet **A, D** are operative coupled as shown in FIGURES 1A and 1B, the locking clip **LC** is resiliently expanded and installed onto the faucet **10**, with the band portion **C1** thereof closely and firmly received in the groove **60G**. The enlarged first end **C2** of clip **C** seats in a space defined by the aligned notches **62a, 62b**, and the enlarged second end **C4** of clip **C** seats in a space defined by the aligned notches **64a, 64b**.  
15 Owing to the one-piece resilient structure of the clip **LC**, the clip is firmly and closely received in the position just described and shown in FIGURES 1A, 1B. This operative installation of the clip **LC** prevents unintended relative rotation between the body **A** and bonnet **D** as would lead to undesired decoupling of these components. More particularly, the enlarged ends **C2, C4** of clip **C**, when seated in the spaces defined by aligned notches  
20 **62a, 62b** and **64a, 64b**, respectively, span the joint defined between the body and bonnet **A, D** and are engaged with both of these components to prevent relative rotation therebetween.

The locking clip **LC** is expanded and removed when decoupling of the bonnet **D** from the body **A** is desired. It is preferred that the enlarged ends **C2, C4** of clip define respective rear edges **C2r, C4r** that overhang a portion of the body **A** and provide a location for  
25 engagement by a blade or other tool to facilitate resilient expansion and removal of the clip **LC**.

Although the body **A** and bonnet **D** are illustrated herein as being coupled via bayonet

mount **28a,28b**, those of ordinary skill in the art will recognize that any other suitable coupling means or structure can be used for operatively coupling the bonnet **D** to the body **A**.

In one alternative embodiment, the body **A** and bonnet **D** include mating threads and are threadably coupled. In another embodiment, the bonnet **D** is affixed to the body **A** with a friction fit, snap-fit or through use of an adhesive. Unless otherwise recited in a claim, it is not intended that the invention be limited to a particular structure or means for operatively coupling the bonnet **D** to the body **A**. The bonnet **D** and body **A** can also be integrated and/or defined as a one-piece construction.

FIGURES 5A and 5B show sectional views of a faucet **10** formed in accordance with the present invention. In addition to the body **A** and bonnet **D** described above, the faucet comprises: a stem **B**, a seal member **E**, a biasing member **F** (shown in FIGURE 5A but omitted from FIG. 5B for clarity) and a handle **G**. The faucet further comprises a spout **C** that, in the illustrated embodiment, is defined as a one-piece construction with the bonnet **D**, but it need not be.

The body **A** is preferably defined from molded polymeric material or the like or metal (e.g., stainless steel, brass, aluminum, etc.), and includes the first end **A1** and second end **A2** as described above. A main bore **20** extends between and through the first and second ends **A1,A2** so that an inlet **22** to the main bore **20** is defined at the first end **A1** and an outlet **24** from the bore **20** is defined at the second end **A2**. The second end **A2** of the body **A**, adjacent the outlet **24**, defines a sealing face or valve seat **26** that is preferable circular.

As described above, the second end **A2** body **A** is adapted to be coupled to the bonnet **D**. The first end **A1** of the body **A** is configured to mate with an urn, or other container of liquid or conduit in a fluid-tight manner as is generally known in the art. In the illustrated embodiment, the first end **A1** includes or defines a flange **30**, and a nut **32** is rotatably carried by the body **A** and is captured on the second end **A2** of the body by the flange **30**, i.e., the nut **32** defines an inside diameter that is less than an outside diameter of the flange **30**. The nut **32** is threadably secured to a mating outlet fitment of an urn or other container or conduit in a



manner so that the inlet **22** of bore **20** is mated in fluid communication with an outlet of the fitment so that liquid flows from the urn or other source into the bore **20**. The bore **20** is preferably cylindrical.

FIGURE 4B shows an alternative body **100A** that is identical to the body **A** except that the first end **A1** of the body **100A** includes male or female threads **T** that allow for direct connection to an associated urn or other container or conduit. In one example, a separate nut advanced onto the threads **T** after the threaded portion is inserted through an opening defined in an urn or other container. In another example, the urn or container of conduit includes an outlet fitment having threads that mate with the threads **T**.

Referring again to FIGURES 5A and 5B, the stem **B** (illustrated separately in FIG. 5C) includes a first portion **40** that is closely and slidably received in the bore **20** via outlet **24**. The first portion **40** is preferably minimally smaller than and shaped to conform to the outlet **24** and bore **20** to minimize any space between the first portion **40** of stem **B** and the body **A**.

The first portion **40** of stem **B** defines flow path such as a bore **42** including an inlet or first end **44** that communicates with the main bore **20** of body **A**. A radial aperture **46** is defined in the male portion **40** and intersects the bore **42** and, thus, defines or provides an outlet or second end of the of the flow path **42**. Those of ordinary skill in the art should note that the inlet and outlet **44,46** of the flow path **42** can be joined by an open slot and need not be separate from each other. For example, the outlet opening **46** can extend axially entirely from the inlet **44** to the seal **E**. In another example, the flow path **42** is defined by one or more grooves defined in the first portion **40** of stem **B** so that liquid flows between the first portion **40** and the portion of body **A** defining the main bore **20**. In another example, the first portion **40** defines an X-shaped cross-section or the like. It is not intended that the structure of the flow path **42** of stem be limited to the exact arrangement shown. The first portion **40** slidably supports the stem **B** relative to the body **A** while allowing liquid flow through the main bore **20** of body **A** under certain conditions described below.

The stem **B** further includes a second portion such as an actuator rod **50** connected to the first portion **40** and having a distal end **50a** that projects outwardly away from the first portion **40**. The rod **50** is connected to and/or is formed as a one-piece construction with the first portion **40** as shown herein. More particularly, as shown herein, the stem **B** is a one-  
5 piece molded polymeric construction.

The stem **B** further comprises a stop flange **52** that extends radially outward at a location between the rod **50** and the male portion **40**. The stop flange **52** defines a diameter or size that is larger than the seat **26** of body **A** and, thus, acts as a stop that limits insertion of the male portion **40** into the bore **20** of body **A**. A shoulder **56** is defined between the stop  
10 flange **52** and the distal end **50a** of rod **50** for reasons described below.

The seal member **E** is preferably defined by one or more elastomeric O-rings or elastomeric flat washers. The seal member **E** is a one-piece annular member that encircles the male portion **40** of the stem **B** and abuts the stop flange **52**. The elastomeric seal **E** can be defined from materials such as, e.g., EPDM, Silicone, a thermoplastic elastomer (TPE).  
15 The seal **E** is frictionally, adhesively or otherwise engaged with the male portion **40** and/or stop flange **52** of stem **300B** so that the seal **E** moves axially with the male portion **40** as described below.

The faucet **10** further comprises a seal retainer **R** that is also shown separately in FIGURE 5D. The seal retainer **R** comprises a cylindrical body **R2** defining a cylindrical  
20 recess **R4** that extends between first and second axial ends **R6a**, **R6b** of the body **R2**. The cylindrical recess **R4** is open at the first end **R6a** of the body, and an end wall **R8** closes the recess **R4** at the second end **R6b**, except for an aperture **R10** defined therethrough.

As shown in FIGURES 5A and 5B, the seal retainer **R** is installed in the faucet **10**, coaxially relative to the stem **B**, so that the end wall **R8** of the retainer abuts the shoulder **56**  
25 of stem **B** and so that rod **50** of the stem extends through the recess **R4** and aperture **R10**. The stop flange **56** is closely received in the recess **R4** with minimal clearance. The seal **E** is at least partially received in the recess **R4** and can be completely received in the recess **R4** so

that the retainer body **R2** prevents or at least limits radially expansion of the seal **E** when the seal **E** is axially compressed as occurs when the seal is biased into sealing engagement with the sealing face or seat **26** of body **A**. The seal **E** is preferably only partially axially inserted into the recess **R4**, i.e., a portion of the seal **E** lies axially outside the recess **R4**, but the body **R2** of the retainer **R** completely encircles the portion of the seal **E** that is axially inserted therein.

The end wall **R8** of retainer **R** defines a reaction surface for the spring or other biasing member **F**. Abutment of end wall **R8** of retainer with shoulder **56** of stem **B** limits movement of the retainer **R** away from the distal end **50a** of stem **B** and limits axial insertion of the seal **E** into the recess **R4**.

With continuing reference to FIGURES 5A and 5B, the bonnet **D** of faucet **10** comprises an integral spout **C**. It is preferred that the bonnet **D** and spout **C** be defined as a one-piece molded polymeric construction, but the bonnet and spout can be separate members that are assembled together. The spout **C** defines a dispensing bore **90**, an inlet **92** to the bore **90** and an outlet **94** from the dispensing bore **90**. The inlet **92** of dispensing bore **90** is located downstream from the outlet **24** of main bore **20** and downstream from the valve seat **26**. As described below, liquid is dispensed by the faucet **10** via dispensing bore **90** of spout **C**.

In addition to the integral spout **C**, the bonnet **D** includes a first end **D1** and a second end **D2**. As noted above, the first end **D1** comprises a female bayonet mount **28b** that mates with the male bayonet mount **28a** of the body **A**. The second end **D2** of the bonnet comprises a transverse end wall **72** that defines an aperture **74** through which the rod **50** of the stem **B** slidably extends so that at least the distal end **50a** of rod **50** is located external to the bonnet **D**.

The bonnet **D** defines a hollow chamber **76** (see also FIGURE 3B) that receives the stem **B**, retainer **R**, seal member **E** and spring or other biasing element **F** as shown in FIGURE 5A. The distal end **50a** of the rod **50** projects outwardly through the aperture **74** so

that it is located outside the chamber **76**. It is most preferred that the stem **B** be at least substantially non-rotatable relative to the bonnet **D** and also positionable only in a single orientation relative to the bonnet **D**. To this end, at least the portion of the rod **50** that moves slidably through the aperture **74** of the bonnet **D** is defined with a non-circular cross-section (see FIGURE 5C) and the aperture **74** of bonnet **D** is formed with like or mating non-circular shape so that the rod **50** (and remainder of stem **B**) cannot rotate relative to the bonnet **D** and also so that the rod **50** can only be inserted through the aperture **74** in one angular orientation. Optionally, as shown herein, the aperture **R10** of the retainer **R** and the portion of the rod **50** that slidably moves therethrough are also formed with mating non-circular shapes to prevent relative rotation between the rod **50** and retainer **R**.

The handle **G** of the faucet **10** is pivotably secured to the distal end **50a** of the rod by a pin or a pivoting snap-fit, both of which are well-known in connection with other faucet structures. The handle **G** is manually movable from a first position as shown in FIGURES 5A and 5B to a second position as shown in FIGURE 6B or a third position as shown in FIGURE 6C. When moved to the second or third positions, a cam portion **G2** of the handle **G** bears against the transverse wall **72** of bonnet **D**, and the shape of the cam portion **G2** is such that when it bears against the wall **72**, the rod **50** of stem **B** is pulled axially out of the chamber **76** via opening **74** so that the seal member **E** moves with the stem **B** away from the seat **26** to open the faucet **10** for dispensing liquid therefrom.

The spring or biasing element **F** is located in the chamber **76** between the wall **72** of bonnet **D** and the wall **R8** of retainer **R**. As such, the biasing element **F** normally urges or biases the retainer **R** away from the wall **72**. As noted, the wall **R8** of the retainer **R** is engaged with the shoulder **56** of the stem **B** and, thus, the retainer **R** urges the stem **B** away from the wall **72** under force of spring **F** so that the seal **E** normally sealingly engages the sealing face **26** of the body **A**. The wall **R8** of the retainer **R** is dimensioned and shaped so that minimal space is defined between it and the portions of the bonnet **D** defining the chamber **76** for all axial positions of the stem **B**. In this manner, the wall **R8** of the retainer

**R** captures the biasing member **F** in the chamber **76** so that any detached fragments of the biasing member **F** cannot escape the chamber **76** and enter the bore **90** of the spout **C**. Furthermore, owing to the presence of the retainer **R** and wall **R8** thereof, and the close fit of retainer **R** in the chamber **76**, the biasing member **F** is not in the liquid flow path that extends  
5 from the inlet **22** of body to the outlet **94** of spout **C** so that cleaning pulp or other solids from the faucet **10** is facilitated and risk of contamination is reduced.

FIGURES 6A and 6B show the faucet **10** fully assembled and in closed (first operative) and opened (second operative) positions, respectively. The biasing member **F** (shown in FIGURE 6A only for clarity) is illustrated as a metal or polymeric coil spring, but  
10 any other suitable biasing member can be used such as, e.g., a slug or other structure/element of elastomeric or other resilient material. In FIGURE 6A, the faucet **10** is in its normally closed position owing to the biasing force of the spring **F** on the retainer **R** and stem **B** which, in turn, causes the seal member **E** to be sealingly engaged with the sealing face **26** of the body **A**. As such, liquid in the bore **20** of body **A** and bore **42** of stem is blocked from  
15 passage past the seat **26** into the outlet bore **90** of spout **C**. In contrast, when the handle **G** is moved to the second position shown in FIGURE 6B or otherwise to pull the rod **50** of the stem **B** out of the chamber **76**, the stem **B** is moved from its first operative position (FIGURE 6A) to the second operative position (FIGURE 6B) where the seal member **E** is axially spaced from the sealing face **26** and the aperture **46** of stem **B** is in fluid communication with  
20 the outlet bore **90** of the spout **C** so that liquid flowing into the bores **20,42** (indicated by the arrow **L**) flows through the aperture **46**, to the inlet **92** of the bore **90** and exits the faucet **10** through the outlet **94** of the bore **90**. The handle **G** can also be moved to a third position shown in FIGURE 6C to move the stem **B** into its second operative (opened) position for dispensing liquid from the faucet **10**.

25 The cam **G2** of the handle **G** is shaped such that when the handle **G** is moved from the first position (FIGURE 6A) to the second position (FIGURE 6B), the faucet is self-closing in that upon release of the manual force under which the handle was moved, the

spring **F** biases the stem **B** and handle **G** back to their respective first operative positions. On the other hand, when the handle **G** is moved from the first position to the third position (FIGURE 6C), the cam **G2** of the handle **G** is shaped so that the handle moves “over-center” and is locked into the third position and must be moved manually at least partially in the opposite direction to close the faucet **10**.

Those of ordinary skill in the art will recognize that when the stem **B** moves from the second operative (opened) position back to its normally-closed (first operative) position, the close sliding fit of the male portion **40** of stem **B** in the bore **20** of body **A** results in a shearing action adjacent seat **26** and aperture **46** whereby any accumulated pulp, crystals or other solids are dislodged so that the seal member **E** is able to form a true fluid-tight seal with the sealing face **26** and so that the pulp or other solids do not inhibit full movement of the stem **B** fully to its normally-closed position.

As noted above, the stem **B** is restrained against rotation and must be installed in only a single select orientation. This arrangement is preferred because the aperture **46** of the stem **B** is preferably oriented relative to the inlet **92** of the spout bore **90** so that these openings directly communicate with each other when the stem is moved to its opened position (FIGURES 6B,6C). While only one aperture **46** is shown, it is contemplated that multiple apertures **46** forming a diffuser or the like be used.

As shown in FIG. 6C, the faucet **10** optionally comprises a flow-control insert **I** installed into the bore **90** of spout **C**. The flow control insert **I** comprises an annular molded plastic member or the like that is closely held in the bore **90** by a friction-fit, adhesive or otherwise. The insert **I** defines a select flow path or bore **I2** that is dimensioned and/or shaped differently as compared to the bore **90** of spout **C** to control liquid-flow characteristics as desired or required for a particular application. In the illustrated embodiment, the insert **I** comprises a tapered inner end **I4** that diverges moving into the bore **90**. This tapered surface **I4** is sometimes preferred so that liquid, pulp and the like are not trapped in the bore **90** by the insert **I**, but the surface **I4** can also be squared-off or transverse

relative to the axis of the bore **90**. As shown, the insert **I** further comprises a radial projection **I6a** that is received into a mating opening **I6b** defined by spout **C** (the opening **I6b** is not shown in FIGS. 3B,5A,5B,6A,6B in order to simplify the drawings).

FIGURES 7A and 7B illustrate an alternative faucet **10'** that is identical to the faucet **10** except as otherwise shown and described. As such, like components are identified with like reference numerals and letters that include a primed (') designation. The faucet **10'** comprises a body **A'** with an integral bonnet **D'** (the body **A'** and bonnet **D'** are preferably defined as a one-piece construction). The body **A'** defines external threads **33'** for connection to an associated liquid container or includes a nut rotatably supported thereon for connection to the associated liquid container.

The body **A'** includes a bore **20'** and sealing face **26'** as described above, and also defines an outlet opening **27'**. A first portion **40'** of a stem **B'** is closely slidably received in the bore **20'**. The first portion **40'** defines a bore **42'** that communicates with the bore **20'** of body **A'**. The first portion **40'** also defines an aperture **46'** that intersects the bore **42'** to provide an outlet therefrom. The stem **B'** includes first and second tabs **U1,U2** that are connected to and project outwardly from opposite lateral sides of the first portion **40'**. These tabs **U1,U2** are adapted to be manually engaged by a user's first and second fingers while the user's thumb is engaged with the end wall **72'** of bonnet **D'**. The tabs **U1,U2** also act as a stop flange and a flange against which the seal member **E'** is positioned and also prevent rotation of stem **B'** relative to body **A'**.

A space is defined between the stem **B'** and the end wall **72'**, and a spring or other biasing member **F'** spans this space and normally urges the stem **B'** away from the wall **72'** so that the first portion **40'** of stem **B'** is fully inserted in the bore **20'** and the seal member **E'** is firmly engaged with the sealing face **26'** (**FIGURE 7C**). As shown in **FIGURE 7B**, the stem **B'** is manually movable against the biasing force of spring **F'** by application of manual force to the tabs **U1,U2** so that the stem **B'** moves to an opened position where the seal member **E'** is spaced from the sealing face **26'** so that liquid can flow from the bore **20'**, into

the bore **42'**, through the aperture **46'**, and out of the outlet opening **27'** of body **A'** as shown by arrow **L'**. Upon release of the manual opening force, the spring **F'** causes the stem **B'** to move axially away from the wall **72'** so that the first portion **40'** of stem **B'** is once again fully inserted into the bore **20'** and the seal **E'** is firmly sealingly engaged with the sealing face **26'**. Here, again, the close sliding movement of the first stem portion **40'** into the bore **20'** results in a shearing action that clears solids such as pulp, crystals or the like from the region of the aperture **46'** and sealing face **26'** in order to facilitate fluid-tight engagement between the seal **E'** and the seat **26'**.

When the seal member **E,E'** is engaged with the seat **26,26'**, only a minimal portion of the seal **E,E'** is exposed to and in contact with the liquid being dispensed. As such, even if liquid remains in the bore **42,42'** for an extended period of time, the seal **E,E'** will not meaningfully alter the taste or other characteristics of the liquid.

An alternative bonnet **D''** is illustrated in FIGURES 8A and 8B and is freely useable in place of the bonnet **D** to assemble a faucet **10** in accordance with the present development. Except as otherwise shown and/or described herein, the bonnet **D''** is identical to the bonnet **D** and like components are numbered accordingly. The bonnet **D''** is adapted to mate selectively with the body **A** as described in connection with the bonnet **D**. As such, the bonnet **D''** comprises a female bayonet mount **28b** including the first and second tabs **T1,T2** for mating with the male bayonet mount **28a** of the body **A**. Unlike the bonnet **D**, however, the bonnet **D''** does not include first and second notches corresponding to the notches **62b,64b** of the body **D**. Instead, the bonnet **D''** comprises first and second outwardly projecting resilient fingers **262b,264b** that are located so that when the bonnet **D''** is mated to a body **A**, the resilient fingers **262b,264b** are closely received in the notches **62a,64a** of the body and lock the bonnet **D''** to the body **A** without requiring use of a separate locking clip **LC**. To remove the bonnet **D''**, the fingers **262b,264b** are resiliently expanded sufficiently to allow relative rotation between the bonnet **D''** and body **A**. Defining the bonnet **D''** and fingers **262b,264b** as a one-piece molded plastic construction has been found to be a suitable



structure for defining the resilient fingers **262b,264b**.

Modifications and alterations will occur to those of ordinary skill in the art upon reading the foregoing detailed description. It is intended that the following claims be construed literally and/or according to the doctrine of equivalents as broadly as possible so as  
5 to encompass all such modifications and alterations.